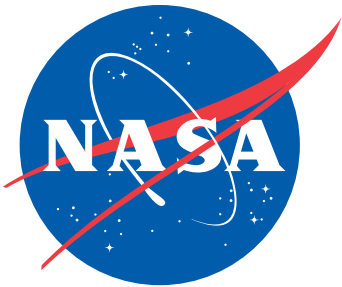


Spaceport News

John F. Kennedy Space Center - America's gateway to the universe



Spirit of Atlantis motivates, inspires

Children from the Kennedy Space Center Child Development Center wave flags as space shuttle Atlantis makes its way home to the Kennedy Space Center Visitor Complex on Nov. 2.

Photo by NASA/Tony Gray

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Atlantis trek keeps spirit of exploration alive

By Steven Siceloff
Spaceport News

NASA gave space shuttle Atlantis a grand sendoff Nov. 2 moving the orbiter 10 miles from its workplace of almost 30 years to a new, custom-built museum exhibition at the Kennedy Space Center Visitor Complex that is to be equipped with some of the most high-tech displays imagined.

"Godspeed, Atlantis, on your next mission of inspiration and motivation," said NASA Administrator Charles Bolden shortly before signing over the retired shuttle for permanent display. "Atlantis' final mission may have closed out the space shuttle program, but the spirit that created that program and built her is very much alive."

Shuttle-era astronauts and members of the workforce who readied the space shuttles for 30 years came in



NASA/Jim Grossmann

Space shuttle Atlantis arrives at its new home, the Kennedy Space Center Visitor Complex, on Nov. 2. Atlantis completed its 10-mile journey from Kennedy's Vehicle Assembly Building with stops during the day for a transfer ceremony in Kennedy's Industrial Area and public viewing in Space Florida's Exploration Park. As part of transition and retirement of the Space Shuttle Program, Atlantis will be displayed in a new exhibit hall at the visitor complex beginning in the summer of 2013.

before sunrise to see Atlantis off.

"I think that the shuttle was a great book, it really was, and this little part is like the epilogue," said Chris Ferguson, who commanded

the last mission of Atlantis, STS-135, which was also the final flight of the shuttle program. "You know, if it's a bad book, you don't read the epilogue. This is a good book, and this is kind of the

story of how it was all made and how it was all done.

This is good."

The move began at about 6:30 a.m. with the shuttle backing out of the Vehicle Assembly Building. Atlan-

tis moved down the wide roadway between the three orbiter processing facility hangars that served as the shuttle fleet's home before being turned around at sunrise to take Kennedy's main roadway south. The trip concluded about

11 1/2 hours later with Atlantis reaching the new exhibit area. The shuttle Atlantis made two ceremonial stops along the way so center employees and then the public could pay tribute.

Fireworks punctuated the evening at the visitor complex as Atlantis halted outside the 90,000-square-foot exhibit hall being built to house the venerable shuttle. The next morning, crews carefully inched the retired orbiter inside the walls. With a 78-foot-wide wingspan and a tail that reaches more than five stories, the spacecraft was too big to be rolled into a completed museum wing,

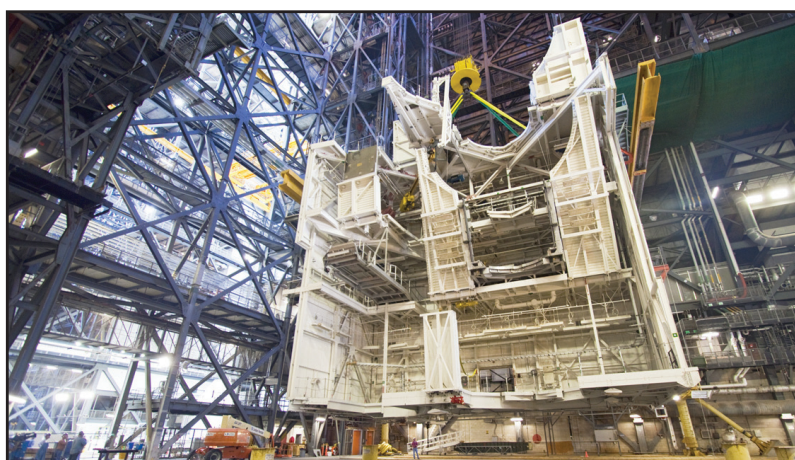
See ATLANTIS, Pages 5-6

VAB mods to support multiple launch vehicles

By Bob Granath
Spaceport News

The Vehicle Assembly Building (VAB) at Kennedy Space Center is undergoing renovations to accommodate future launch vehicles. A project of Ground Systems Development and Operations (GSDO), space shuttle-era work platforms have been removed from the VAB's High Bay 3 and accommodations are being made to support a variety of future spacecraft, including NASA's Space Launch System (SLS) heavy-lift rocket. The changes are part of a centerwide modernization and refurbishment initiative in preparation for the next generation of human spaceflight.

One of the largest buildings in the world, the VAB was constructed in the mid-1960s to support stacking of the Apollo Saturn V rockets that



NASA/Jim Grossmann

As part of Ground Systems Development and Operations Program work at Kennedy Space Center, space shuttle-era work platforms are removed from high bay 3 in the Vehicle Assembly Building on Oct. 24. All platforms were removed two days later.

took American astronauts to the moon. In the late 1970s, the facility was refurbished to accommodate the space shuttle. Following three decades of flight, the space shuttle was retired in 2011.

Plans now call for the VAB to be able to support multiple types of space vehicles, including the SLS, Orion spacecraft and commercial rockets. NASA is partnering with private industry on rockets

and spacecraft to take astronauts to low-Earth orbit and the International Space Station. SLS will be an advanced heavy-lift launch vehicle providing a new capability for human exploration beyond Earth orbit.

"After more than 45 years of use, it was time to clear out and update the garage," said Jose Lopez, VAB senior project manager in the Vehicle Integration and Launch Support Branch of GSDO. "What makes this project such a major undertaking is the size."

The VAB is 526 feet tall, 716 feet long and 518 feet wide. It covers eight acres and encloses more than 129 million cubic feet of space. The building was constructed to withstand hurricanes and tropical storms with a foundation consisting of 30,000 cubic yards of concrete and

See VAB, Page 9

Third Commercial Crew Development phase kicks off

By Rebecca Regan
Spaceport News

Three American companies with three very different spacecraft and rocket combinations are off and running on the next design and development phase for NASA's Commercial Crew Program (CCP). Working with different capsule and spaceplane specifications, the companies have set about proving their systems will meet the demands of launching and sustaining humans in space.

"All of our industry partners are now pushing their human space-flight technologies further than ever before so America can have its own crew transportation system around the middle of the decade," said Ed Mango, CCP's program manager. "In the future, NASA could be certifying that these and other systems are safe enough to begin ferrying our astro-

nauts to and from the International Space Station."

The Boeing Company, Space Exploration Technologies (SpaceX) and Sierra Nevada Corp. (SNC) spent the last two months kicking off the agency's Commercial Crew Integrated Capability (CCiCap) phase, completing their first few performance milestones.

During its integrated systems review (ISR) in Houston, Boeing presented the latest designs of its CST-100 spacecraft, United Launch Alliance (ULA) Atlas V rocket launch system, and ground and mission operations. These designs will serve as the baseline for further development work to be accomplished during CCiCap. Boeing also discussed its plans for safety and mission assurance, which ultimately could contribute to achieving certification of the system for NASA's

space station needs.

"The ISR established a firm baseline configuration that will allow our team to push forward with the final vehicle design," said John Mulholand, Boeing vice president and program manager for Commercial Programs. "We hope the rigor of our design and development process, and our outstanding team of suppliers will help position the CST-100 as one of the next crew transportation vehicles to the space station and other low-Earth orbit destinations."

At the review, Boeing also presented results from numerous tests that were conducted as part of its earlier Commercial Crew Development Round 2 (CCDev2) Space Act Agreement with NASA. These tests included parachute and air bag drops, abort engine firings and wind tunnel tests.

SpaceX completed its first three

performance milestones at its headquarters in Hawthorne, Calif., which included technical reviews of the Dragon spacecraft, Falcon 9 rocket and future plans for ground operations in support of crewed flights. SpaceX also presented the techniques it will use to design, build and test its integrated system, including a pad abort test and in-flight abort test from Space Launch Complex 40 at Cape Canaveral Air Force Station in Florida.

This transition for SpaceX into NASA's CCiCap phase comes on the heels of completing its CCDev2 partnership with NASA. During CCDev2, the company made progress designing, developing and initially testing components of a launch abort system (LAS), one of the most challenging aspects of building a system safe enough to

See CCP, Page 8

Blue Origin's pusher escape system rockets full-scale crew capsule

By Rebecca Regan
Spaceport News

NASA's Commercial Crew Program (CCP) partner Blue Origin conducted a successful pad escape test Oct. 19 at the company's West Texas launch site in Van Horn, firing its pusher escape motor and launching a full-scale suborbital crew capsule from a simulated propulsion module.

The test was part of Blue Origin's work supporting its funded Space Act Agreement with NASA during

More online

For more information about NASA's Commercial Crew Program, visit: www.nasa.gov/commercialcrew or join the conversation on Facebook and Twitter.

Commercial Crew Development Round 2 (CCDev2). CCDev2 continues to bring spacecraft and launch vehicle designs forward to develop a U.S. commercial crew space transportation capability that ultimately could become available for the government

and other customers.

"The progress Blue Origin has made on its suborbital and orbital capabilities really is encouraging for the overall future of human spaceflight," said Ed Mango, manager of CCP, which is primarily based at Kennedy Space Center. "It was awesome to see a spacecraft NASA played a role in developing take flight."

The suborbital crew capsule traveled to an altitude of 2,307 feet during the flight test before descending safely by parachute to a soft land-

ing 1,630 feet away.

The pusher escape system was designed and developed by Blue Origin to allow crew escape in the event of an emergency during any phase of ascent for its suborbital New Shepard system. As part of an incremental development program, the results of this test will shape the design of the escape system for the company's orbital biconic-shaped Space Vehicle.

The system is expected to enable full reusability of the launch vehicle, which is dif-

ferent from NASA's previous launch escape systems that would pull a spacecraft away from its rocket before reaching orbit.

"The use of a pusher configuration marks a significant departure from the traditional towed-tractor escape tower concepts of Mercury and Apollo," said Rob Meyerson, president and program manager of Blue Origin. "Providing crew escape without the need to jettison the unused escape system gets us closer to our goal of safe and affordable human spaceflight."



CLICK ON PHOTOS

Photos courtesy of Blue Origin

Blue Origin conducts a pad escape test at the company's West Texas launch site Oct. 19, firing its pusher escape motor and launching a full-scale suborbital crew capsule from a simulated propulsion module. Blue Origin's suborbital crew capsule traveled to an altitude of 2,307 feet during the flight test (left) before descending safely by parachute (center) to a soft landing 1,630 feet away (right).

Scenes Around Kennedy Space Center



NASA/Frankie Martin

Space Florida was recognized with a Silver Excellence in Economic Development Award for its Boeing/Kennedy Space Center commercial partnership project in the category of “Public-Private Partnerships for communities with populations of 500,000 or more” from the International Economic Development Council (IEDC). President Frank DiBello, left, in turn presented Kennedy Director Bob Cabana with a symbol of appreciation for his support.



NASA/Rick Wetherington

More than 28 mentors interacted with students and job seekers on Disability Mentoring Day around Kennedy Space Center. The Oct. 22 event was sponsored by the Disability Awareness and Action Working Group (DAAWG), in partnership with the Education Office. Here, Connor Botsford of Winter Park High in Orlando, is guided by Henry Collier of the Chief Financial Office.



NASA/Ben Smegelsky

Early on Oct. 30, a full moon is seen above the water tower in Kennedy Space Center's Launch Complex 39.



NASA/Ben Smegelsky

A pair of raccoons inside a Kennedy Space Center dumpster were surprised by a photographer earlier this year.

Child Development Center hosts costume parade



The Kennedy Space Center Child Development Center hosted its annual Fall Festival on Oct. 26. Activities included a costume parade and pumpkin patch photographs. Parents and younger children, who dressed up as well, watched as the preschoolers marched around the center in costumes.

Photos by NASA/Jim Grossmann



Atlantis: The final space shuttle journey



CLICK ON PHOTO

Led by the Merritt Island High School Color Guard and the Titusville High School band, space shuttle Atlantis is transported along NASA Causeway at Kennedy Space Center on its 10-mile journey to the Kennedy Space Center Visitor Complex on Nov. 2.



CLICK ON PHOTO

A fireworks show frames space shuttle Atlantis as it enters the Kennedy Space Center Visitor Complex on Nov. 2 following a 10-mile move from the Vehicle Assembly Building.

From ATLANTIS, Page 2

so the last wall will be erected behind it during the next few weeks.

The spacecraft will be covered in some 16,000 square feet of shrink wrap to protect it while workers finish the inside of the exhibit hall and then stand Atlantis on a 36-foot-high pedestal where it will be seen as it flew in space with cargo bay doors open, landing gear retracted and the robotic arm deployed.

The museum is slated to open in July 2013.

For some, seeing Atlantis move into its final home was worth a special trip of their own. Gayle Dye of Albuquerque, N.M., made trips to Florida to see several shuttle launches and drove to White Sands Space Harbor in her home state to see Endeavour fly over on the back of the modified 747 Shuttle Carrier Aircraft.

"I've kind of done the whole gamut now, from launch to the 747 and now to seeing it in person," Dye said. "I just got hooked on launches. It's the adventure of space."

Atlantis made the trip atop Ken-



CLICK ON PHOTO

Space shuttle Atlantis moves out of the Vehicle Assembly Building at Kennedy Space Center on Nov. 2 or its 10-mile trip to where it will be put on public display. As part of transition and retirement of the Space Shuttle Program, Atlantis is to be displayed at the Kennedy Space Center Visitor Complex beginning in the summer of 2013. During the course of its 26-year career, Atlantis traveled 125,935,769 miles during 307 days in space over 33 missions.

nedy's low-slung, 76-wheel vehicle known as the orbiter transfer system. A parade including a marching band and a phalanx of shuttle workers and astronauts accompanied the shuttle to a ceremony to sign over the artifact for display.

"Atlantis now takes on a mission of inspiration for future exploration," said shuttle astronaut Bob Cabana, director of Kennedy.

Following a signing ceremony, Atlantis was taken on a route through Kennedy's Industrial Area where it passed by the center's headquarters

and other facilities before taking a turn and passing by the Space Life Sciences Laboratory, a research facility whose work includes developing and implementing scientific experiments for the International Space Station.

The shuttle convoy paused at Exploration Park for a few hours where visitors could see the gigantic spacecraft up-close, have their pictures taken with it and participate in a festival of space-related displays and activities.

"It would've been weird not to come out here," said Kim Siems,

who lives near Kennedy.

Atlantis made its first trip into orbit in October 1985, when it flew a classified mission for the Department of Defense. It made its second trip into space a month later and by the time it retired in 2011, Atlantis had completed 33 successful missions.

Atlantis' mission log includes launching the Magellan spacecraft to map Venus and the Galileo

probe to Jupiter, both in 1989.

"Both of those were stunning scientific successes," said Roger Launius, curator at the Smithsonian's National Air and Space Museum and NASA's former chief historian. "It's hard to underestimate the importance of those flagship missions."

Having started its space-flight career flying Cold War missions, Atlantis became a high-profile sym-

bol of cooperation in 1995 when the shuttle docked with the Russian space station Mir.

"The Mir missions are essentially the dry run for the cooperative effort for the International Space Station," Launius said.

Atlantis is the third and final shuttle of NASA's former operational fleet to be moved into a museum.

Discovery, the oldest active shuttle at its time



CLICK ON PHOTO

NASA Administrator Charlie Bolden, left, and Kennedy Space Center Director Bob Cabana hold the just-signed document transferring the title of space shuttle Atlantis to the center as Atlantis pauses during its 10-mile journey to the Kennedy Space Center Visitor Complex for a ceremony to commemorate the transfer. Participating in the ceremony, from the left, are Chris Ferguson, who commanded Atlantis' final mission; Bolden; Cabana; Karol Bobko, commander of Atlantis' first mission; and Delaware North Companies Parks and Resorts Chief Operating Officer Bill Moore.



CLICK ON PHOTO

Space shuttle crossing signs were set up around Kennedy Space Center on Nov. 2 to highlight Atlantis' 10-mile trip to the Kennedy Space Center Visitor Complex. Above, a mock-up Orion capsule is shown in the background at Space Florida's Exploration Park.

Atlantis Move By The Numbers

- 1 – High voltage line removed
- 23 – Traffic signals moved
- 56 – Traffic signs moved
- 120 – Light poles moved
- 16,000 – Square footage of shrink wrap to cover Atlantis during finishing of exhibit area
- 90,000 – Square footage of Atlantis' exhibit hall now under construction

Source: NASA/
Kennedy Space Center Visitor Complex

NASA's Scenes Around The Nation



CLICK ON PHOTO

NASA/Charisse Nahser

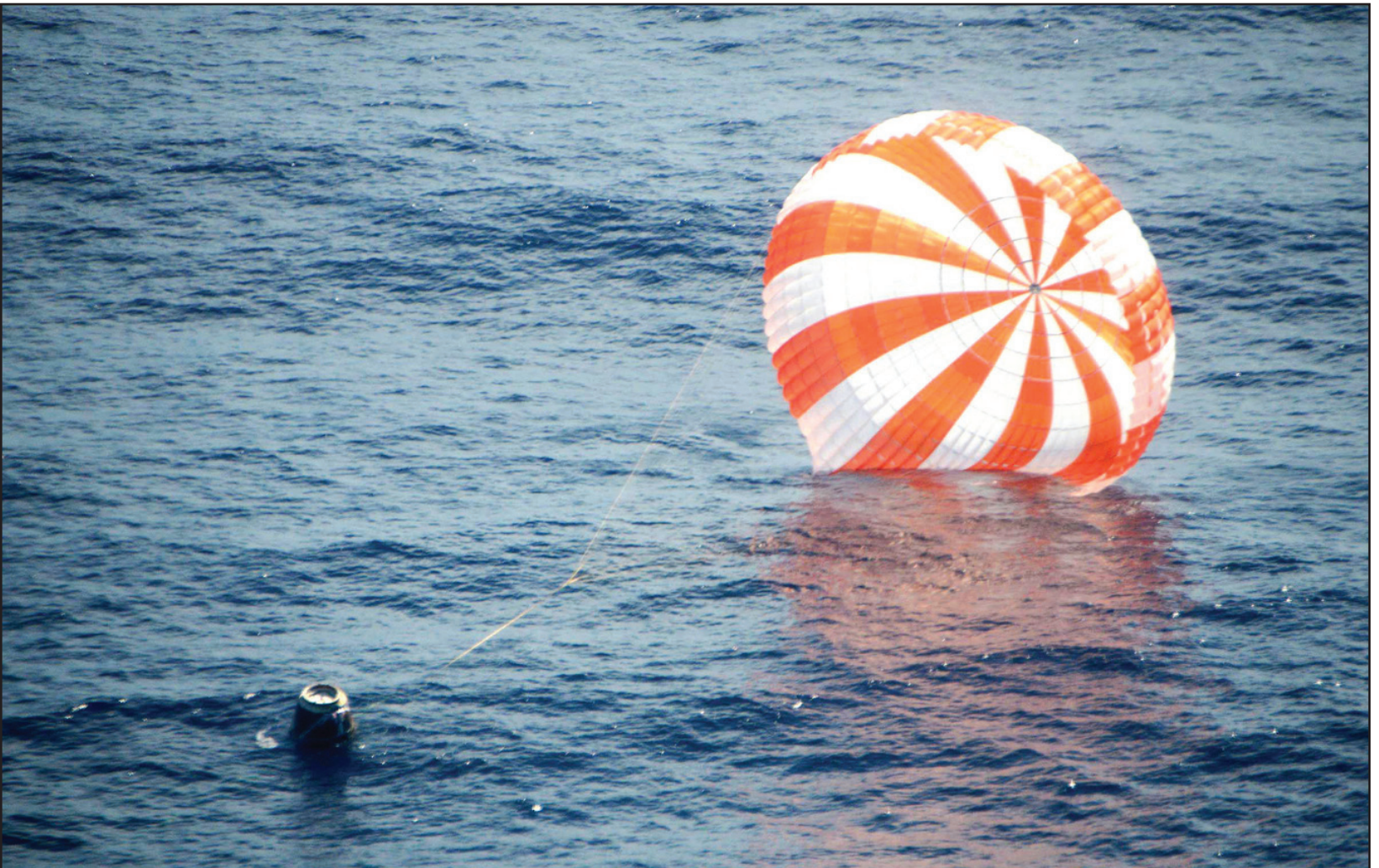
A Centaur stage is offloaded from the United Launch Alliance barge Delta Mariner that arrived at Port Canaveral, Fla., Oct. 20. The Centaur will be part of a launch vehicle that will boost the Tracking and Data Relay Satellite-K, or TDRS-K, into Earth orbit atop an Atlas V rocket. The TDRS-K spacecraft is the first of the next-generation series in the Tracking and Data Relay Satellite System, a constellation of space-based communication satellites providing tracking data and telemetry with high-bandwidth capability for the International Space Station and spacecraft in Earth orbit.



CLICK ON PHOTO

NASA

Engineers at Orbital Sciences Corp. in Gilbert, Ariz., mechanically integrate the Operational Land Imager (OLI) onto the Landsat Data Continuity Mission (LDCM) spacecraft on Oct. 18. The integration took three days. This photo shows the OLI wrapped in blankets that provide a barrier to contamination. LDCM is scheduled to launch Feb. 11 from Vandenberg Air Force Base, Calif.



CLICK ON PHOTO

Photo courtesy of SpaceX

A Space Exploration Technologies (SpaceX) Dragon spacecraft splashed down in the Pacific Ocean on Oct. 28, a few hundred miles west of Baja California, Mexico. The splashdown successfully ended NASA's first contracted cargo delivery flight to resupply the International Space Station.

Rocket U engineers push aerial boundaries

By Steven Sicheloff
Spaceport News

Engineers at Kennedy Space Center continue to stretch their intellectual legs with projects outside their specialties. A team of participants in Rocket University (Rocket U) is building a fuel cell-powered unmanned aerial vehicle and support systems to perform missions such as wildlife surveillance around the expansive space center.

"One of the goals is to get people exposure to some of the more contemporary technologies," said Michael Dupuis, who is leading the unmanned aerial systems group. Dupuis worked on the space shuttles' fuel cell systems, including the power reactant storage and distribution system (PRSD).

Basically, the goal is to build a 9-foot-wide airplane with a narrow fuselage that can pilot itself over the iconic Kennedy landscape without jeopardizing land-



Photo courtesy of Rocket University

Participants in Rocket University conducted a test in October of the video system that will be used in the program's unmanned aerial vehicle project.

marks such as the Vehicle Assembly Building and launch pads.

It will run on a fuel cell that uses hydrogen and collects oxygen from the air to produce electricity.

The aircraft will carry a small camera and be able to capture precise images and statistics on the wildlife that live inside the 140,000-acre wildlife refuge at Kennedy.

Apart from developing an aircraft, known as an Unmanned Aerial Vehicle (UAV), the project also

must account for all the things that go into operating it, planning its flights and collecting information from the mission. It is in this network, called the UAS with "systems" replacing "vehicle," that Dupuis said real advances can be made in the project.

Consider, for example, that no unmanned aircraft has ever flown in Kennedy airspace.

"Just the fact that a UAS went through the process to be certified to execute a mission out here and to go execute that mission, that's going to be new ground for Kennedy," Dupuis said. The adjustment is more than academic since Kennedy is going to play a larger role in certifying rockets and spacecraft for flight in the future as the spaceflight business expands into non-traditional areas.

Rocket U is far from simply presenting technical challenges to overcome. It is as much about learning how to move a team of engineers through a series of steps, including peer reviews, to complete a mission using NASA practices that

have governed scores of missions.

That doesn't mean the task is a grind through bureaucratic checklists, participants said.

Beyond the challenges of building an aircraft and letting it fly on its own, the Rocket U participants routinely turn their education into inspiration. Engineers visit classrooms to show middle- and high-school students the delight of learning, then using math and science to build cool things.

"The earlier you can get somebody excited about science, technology, engineering and math (STEM education), the better," Dupuis said.

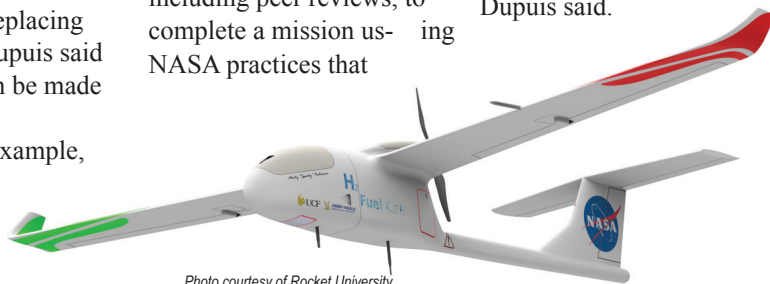


Photo courtesy of Rocket University

The design of the Rocket University unmanned aerial vehicle calls for a 9-foot wingspan and 6-inch-wide fuselage.

From CCP, Page 3

carry humans into space.

"Our NASA team brought years of experience to the table and shared with SpaceX what components, systems, techniques and processes have worked for the agency's human space transportation systems in the past and why they've worked," said Jon Cowart, the NASA partner manager of SpaceX during CCDev2.

"This sharing of experience benefited both NASA and the company and is creating a more dependable system at an accelerated pace."

During a program implementation plan review in Louisville, Colo., SNC outlined for NASA the steps it plans to take while it readies its Dream Chaser spacecraft for a crewed orbital demonstration flight atop ULA's Atlas V rocket.

"During CCiCap, they hope to

retire significant subsystem development risk so that they are ready to have the integrated Critical Design Review and ready to go into manufacturing of the space vehicle," said Cheryl McPhillips, NASA partner manager.

While Boeing and SNC continue to advance their spacecraft designs, their chosen launcher, the Atlas V, is moving forward to support initial test launches. During its unfunded

CCDev2 partnership, the company established a technical foundation for certifying its rocket for NASA crews launching to the International Space Station. ULA also developed the design criteria for the Atlas V's emergency detection system, established requirements for the rocket's dual-engine Centaur configuration and selected the design approaches for accommodating humans and their spacecraft at its launch site.

Print Your Own CCP Posters

To download your Commercial Crew Integrated Capability (CCiCap) posters, click on the poster images at right.



Digital age makes cybersecurity ultra important

By Brittney Longley
Spaceport News

NASA celebrated the ninth annual National Cybersecurity Awareness month by implementing several outreach events to educate the workforce about securing themselves on- and offline.

Held in October and sponsored by the Department of Homeland Security, the theme was designed to remind everyone of the importance of online security awareness in an effort to reach the goals of the agency.

"We wanted to increase awareness," said Henry Yu, chief information security officer at Kennedy Space Center. "We wanted to help remind people to protect themselves while online."

The Information Technology and Communications Services Directorate (IT) set up booths across the center in a different building each Tuesday throughout October. IT Security Office



NASA/Jim Grossmann

Kennedy Space Center's IT Security Office team members dress as pirates Oct. 23 to grab the attention of employees to explain the importance of cybersecurity during National Cybersecurity month.

team members dressed as pirates and educated employees on cybersecurity, with an online scavenger hunt that asked employees questions about cybersecurity.

NASA IT Security posted informational videos on the KSC portal and YouTube to share the best practices that should be used to safeguard themselves when using computers on a day-to-day basis. While ensuring that all employees are becoming more aware

of cybersecurity, the videos also teach employees how to become more aware when traveling with computers, and how to protect themselves and their belongings.

Data at Rest (DAR) implementation is another major NASA chief information officer (CIO) initiative to help increase cybersecurity measures. The DAR software encrypts the hard drive, an additional layer of protection to sensitive data stored on the laptops.

Employees also should

avoid using hotel computers and network services while traveling.

"I recommend against using hotel computers if possible," said Yu.

With no way of knowing if there is malware on the computers, there is a possibility that your credentials can be tracked, captured and later used by hackers when you log into a site.

IT suggests that if you must use a hotel computer that you use a secure website and change your password as soon as possible when you return home.

When using a laptop

while traveling, be aware that the Wi-Fi connection is not secure and can be hacked. If you are on government travel, be sure to establish a Virtual Private Network (VPN) connection back to the center before making an online transaction.

While the Internet has become more prominent in our everyday lives, the risk and dangers of using it have increased, making awareness of cybersecurity imperative to anyone who uses the Web. "In this digital age, cybersafety is more important than ever," Yu said.

More information online

Heads Up: Stop. Think. Connect.

<http://www.ftc.gov/bcp/edu/pubs/consumer/tech/tec19.pdf>

Living Life Online

<http://www.ftc.gov/bcp/edu/pubs/consumer/tech/tec15.pdf>

Laptop Security Tips Bookmark

<http://www.ftc.gov/bcp/edu/pubs/consumer/bookmarks/bmk08.pdf>

Identity Theft: What To Know, What To Do

<http://www.ftc.gov/bcp/edu/pubs/consumer/idtheft/idth01.pdf>

Your Access to Free Credit Reports

<http://www.ftc.gov/bcp/edu/pubs/consumer/credit/cre34.pdf>

From VAB, Page 2

4,225 steel pilings driven 160 feet into bedrock.

The first step in the plan was to remove space shuttle-era work platforms, a project that presented numerous challenges.

"Imagine having to use a crane to safely lower to the ground a structure the size of a large home," Lopez said. "That provides perspective on what it was like to remove the old shuttle work platforms."

There were eight box-like support structures surrounding the shuttles during stacking in the VAB. One box platform structure had been removed in 2009 in preparation for the launch of the Ares I-X test vehicle in October 2009. Each platform structure had work stands, connections for electricity, water, pneumatics and other commodities.

"For this undertaking, we selected an experienced construction contractor to help us remove and demolish

the work platforms," said Lopez.

Ivey's Construction Inc. of Merritt Island, Fla., began the task in early September. Working closely with NASA and other Kennedy contractors such as United Space Alliance and URS, as well as an on-call architectural and engineering firm BRPH, they helped ensure all systems in the VAB were disconnected from the platforms.

"There were several key factors to consider in order for platforms to be safely lowered to the floor, such as determining the center of gravity in each box platform section," Lopez said.

He noted that a few of the platforms were the size of a three-story building and weighed between 300,000 and 325,000 pounds.

"The effort to lower each platform took place over several hours to ensure full control of the suspended load. They were then set on stanchions on the VAB floor,"

said Lopez. "Once checkout was complete, the platforms were moved outside on a transporter where Ivey's Construction crews demolished the structures so the debris could be safely hauled away."

The effort also required a great deal of coordination to ensure the project was completed safely.

"There are several renovation projects going on in the VAB right now," Lopez said. "Tour guests from the Kennedy visitor complex were coming through, so we made sure to coordinate the work so it could be completed with safety being our number one priority."

The next major project will be to install a new fire suppression system.

"This will modernize the fire suppression water supply system and bring it up to modern codes," he said.

Other major renovation includes code upgrades and safety improve-

ments to the VAB. Some of the utilities and systems slated for replacement have been used since the VAB was completed in 1966. This initial work will be required to support any launch vehicle operated from Launch Complex 39 and will allow NASA to begin modernizing the facilities while vehicle-specific requirements are being developed.

"Our plans for 2014 include awarding the constitutional contract for the new access platforms, including related structures and systems required for the SLS," Lopez said.

Some of the current work has included removal of over 150 miles of obsolete Apollo- and shuttle-era cabling. This will make room for installation of more efficient, state-of-the-art command, communication, control and power systems needed to perform testing and verification prior to the SLS and other rockets being rolled out to the launch pad.

High-powered rocketry labs hone flight skills

By Anna Heiney
Spaceport News

Engineers at Kennedy Space Center are gaining critical flight skills as they design, build and launch high-powered rockets at the spaceport's Rocket University.

Rocket U provides an opportunity to collaborate with other NASA centers, such as Johnson Space Center in Houston, Marshall Space Flight Center in Huntsville, Ala., and Wallops Flight Facility in Virginia.

"A large portion of our engineering workforce was dedicated to manned space-flight operations (during the Space Shuttle Program era)," said Kevin Vega, assistant chief engineer for the agency's Commercial Crew Program (CCP) and the Rocket University rocketry lab lead. "Since CCP is a manned spaceflight systems program established and run out of Kennedy Space Center, we should be bringing to

bear those skills required to analyze, evaluate and certify any system that decides to pursue that goal for NASA, the nation, or commercially."

Rocket U engineers from a variety of disciplines take part in small-scale labs to gain hands-on experience as they develop flight skills.

The rocketry course began in spring 2012. First, an introduction to high-powered rocketry exposed the engineers to the rocket's appearance and operations. After building and launching a vehicle of their own, they moved on to the week-long Advanced Rocket Workshop presented at Kennedy by Marshall Space Flight Center Chief Engineer Pat Lampton.

Then the group was divided into four small teams. Each was tasked with designing, building and flying its own rocket.

These are high-powered rockets generating 300 to 900 pounds of thrust. Rocket components are off-the-shelf hardware but were ordered

by Vega according to each team's needs. All four teams are designing their own flight computers, using commercially available flight computers as a reference.

"I gave them a project plan with primary and secondary mission objectives, and an outline structure of how they needed to organize their team: who's doing what, how are you going to mitigate risk, what analysis are you going to do, and so forth," Vega said.

Gradually, the requirements are refined and the design is analyzed as each team's work passes through official reviews. This sequence is a tailored version of the standard review process for launch vehicles.

All four rockets are expected to fly by the end of November. In the final phase of the program, the teams will merge to develop a supersized, three-stage system capable of flying to an altitude of 150,000 feet,



Photo courtesy of Kevin D. Vega

Rocket University teammates prepare to launch their rocket July 14 from a launch site in Bunnell, Fla.

potentially carrying a payload of a few experiments.

"Four different teams with four different ideas, all flying on these smaller-scale rockets, will then funnel into this large-scale rocket that will take us about a year to

develop," Vega explained.

"They'll be able to bring all their lessons learned and ideas from that flight computer design for each one of those teams to create the one main flight computer on this bigger rocket."

In celebration of Kennedy Space Center's
50th anniversary, enjoy this vintage photo . . .

FROM THE VAULT



NASA file/1972

Apollo 17 astronauts, from left, Lunar Module Pilot Harrison Schmitt, Command Module Pilot Ron Evans, and Commander Gene Cernan, pose during the rollout of the Saturn V rocket Aug. 28, 1972. The trio launched Dec. 7, 1972, en route to the moon. Six days later, Cernan became the 12th and final man to set foot on the lunar surface and is the final person to step off of it as well. The Astronaut Scholarship Foundation is hosting an Apollo 17 40th Anniversary and Apollo Program Celebration Dinner on Nov. 3 at the Radisson Resort at the Port in Cape Canaveral, Fla.

Looking up and ahead . . .

No Earlier Than Nov. 27

USAF Launch/Cape Canaveral Air Force Station
(SLC-41): Atlas V,
Orbital Test Vehicle (OTV)
Launch window: 11:45 a.m. to 3:45 p.m. EST



John F. Kennedy Space Center

Spaceport News

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